THE LURE OF MEDICAL HISTORY*

HIERONYMUS FABRICIUS AB AQUAPENDENTE*

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III

WE have considered the first two of the five works by Fabricius, contained in the volume we are examining,† and now come to the third—a document, like *De Formato Fœtu,* of the highest value in the history of embryology. And here, reverting again to Harvey, we may say that in his treatise *On Generation* Harvey leaned heavily on this work of Fabricius. It is entitled *De Formatione Ovi et Pulli,* and is illustrated with seven magnificent full-page copper plates. Dr. Grindon says:

*A Twenty-five Years Ago column, made up of excerpts from the official journal of the California Medical Association of twenty-five years ago, is printed in each issue of California and Western Medicine. The column is one of the regular features of the Miscellany Department of California and Western Medicine, and its page number will be found on the front cover index.

* Part I of this article was printed in the March issue and Part II in the April number of CALIFORNIA AND WESTERN MEDICINE.

† For welcome aid and helpful suggestions with some of the difficulties encountered in the translations from the original Latin texts, for the purpose of the present study, it is a pleasure to express thanks to my friends, Professor L. H. Loenholm, formerly of the University of Tokio, and to Professor Herbert B. Hoffleit of the University of California at Los Angeles.

† See footnote to Part I in March issue of CALIFORNIA AND WESTERN MEDICINE.

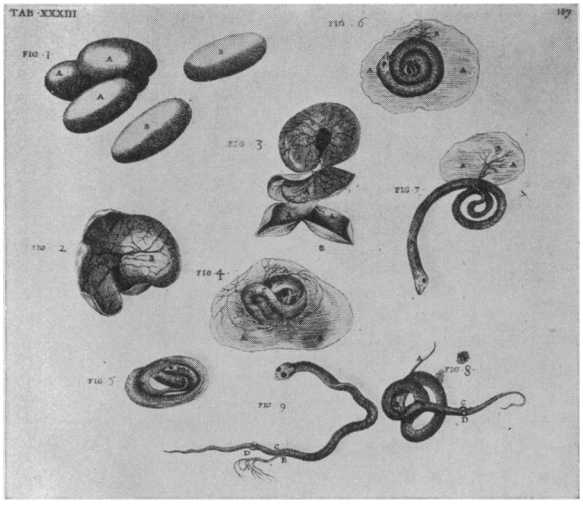


Fig. 8.—Figures 1-9, Plate xxxiii, of *De Formato Fœtu.* Figure 1 shows five eggs of the snake. A, A, A, three eggs united by the tunic only. B, B, two eggs separated from the membrane. Figure 2, the prior tunic separated from the other one lying below. A, the first tunic of the egg, full of veins. B, the other tunic, lying below. C, the trunk of the vein running through it. Figure 3 shows A, A, A, the internal part of the prior tunic. B, the second opposite part of the tunic. C, a small part similar to a cone where the tunic is missing. Figure 4 shows the first tunic removed from above, and the two tunics lying below, one very thick, the other thin and lying close by the fetus; also the position of the fetus. A, A, A, the second tunic. B, the third tunic, touching the fetus. C, fetus. Figure 5 shows the position of the fetus extricated from one exterior spiral, the better to visualize the position of the upper fetus. Figure 6, a variation in the position of the other fetus. A, A, the thick membrane or chorion. B, the umbilical vessels. Figure 7, the same fetus drawn out, the head hanging down so as to show better the umbilical vessels. A, A, chorion. B, umbilical vessels. Figure 8, the snake rolled together. A, the umbilical vessels. B, the place of their insertion. C, the interstice between the testicles and the navel. D, the testicles.

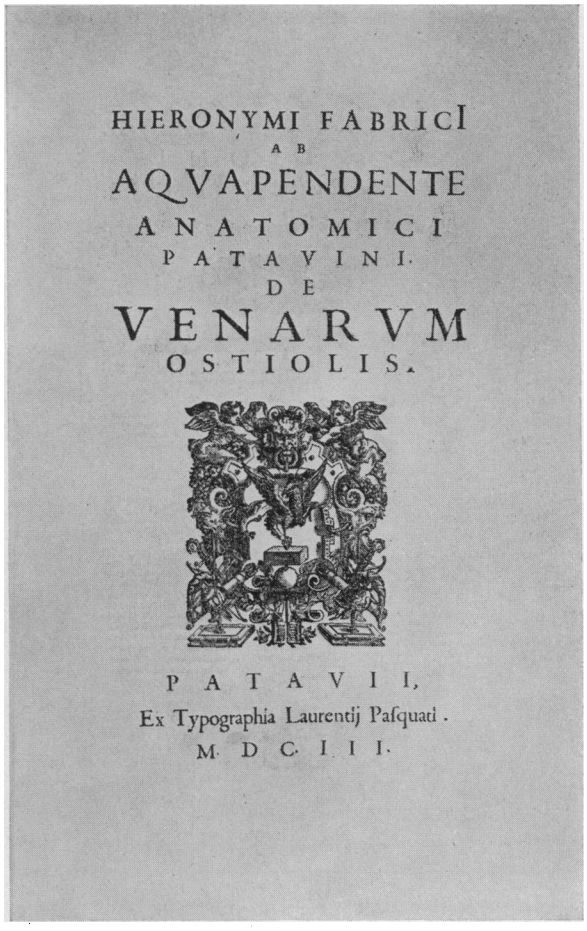


Fig. 9.—Frontispiece of *De Venarum Ostiolis.* Translation:
Hieronymus Fabricius of Aquapendente, Anatomist,
of Padua,
on
The Valves of the Veins
Padua
From the press of Laurentius Pasquatus
1603

Note: On the dedicatory page it says that "Hieronymus Fabricius dedicates this book to the glorious German Nation."

"More than ten generations of physicians have unceasingly labored since this work was written, and yet, all things considered, it is wonderfully full and correct. A quaint passage describes the method by which the chick finally issues from the egg: 'The chick needing air, by its chirping notifies its mother that it is time to break the shell, its own beak being too soft for the purpose. There is, however, sufficient space and air to permit the chick to chirp loud enough to be heard, as both Pliny and Aristotle bear witness. The chirping may have a pleading sound (forteque quidpiam petentis significatrix) and the hen, hearing it and understanding the need, or, if you please, eager to behold her chick and most dear child (pulli dilectique filii conspiciendo desiderio), pecks open the shell.' The error of this description was pointed out some years later by Harvey, who correctly insisted that the chick makes its escape without the aid of the hen."

The fourth study in our book is a treatise *De Loquela Brutorum,* which contains, says Doctor Grindon, some queer statements: "Our author

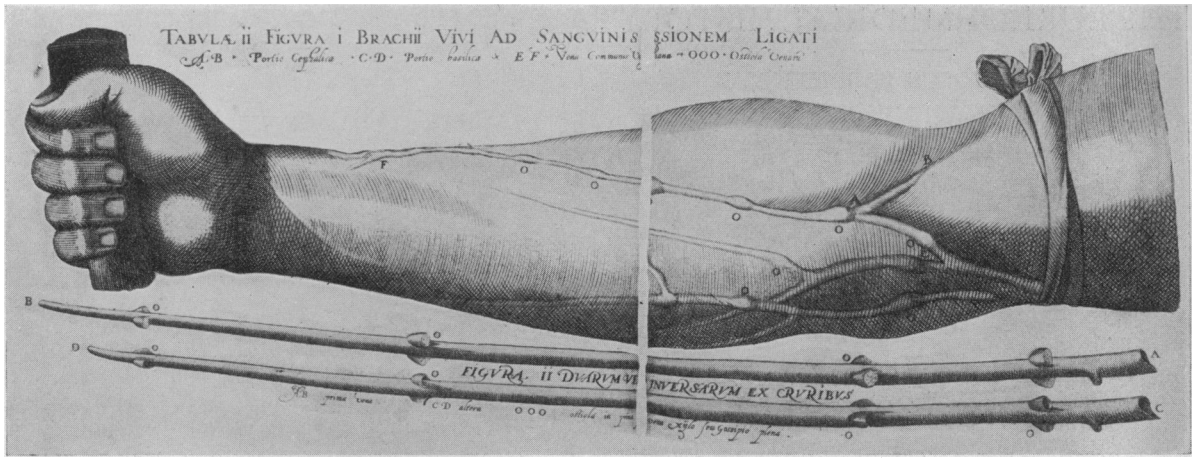
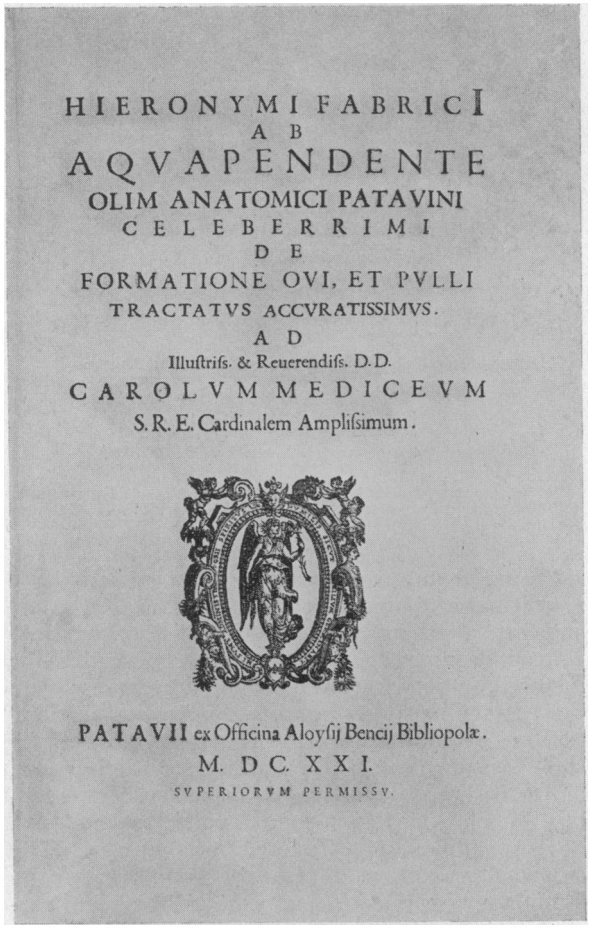


Fig. 10.—Figures i and ii, Plate ii, of *De Venarum Ostiolis.* Figure i shows a living arm, the upper arm compressed by a bandage, as in blood-letting, A-B, portion of the cephalic or humeral vein. C-D, portion of the basilic or jecorary vein. E-F, "vena communis" or vena mediana, in which, as in other veins, the valves, O, O, O, appear like nodes; these valves can be seen outside in the living arm. Figure ii shows two inverted veins of the legs; how the valves, O, O, O, stand inside the cavity of the veins is clearly shown. But from an inspection of those inverted veins, the singular fact appears that the first, or upper, valves are placed at an angle to the next following, like the branches in plants. Also note that in the upper vein, A-B, the valves are filled with xylon or gossipion, in order to show them better; but in vein C-D the valves are empty.


HIERONYMI FABRICI
A B
AQVAPENDENTE
OLIM ANATOMICI PATAVINI
CELEBERRIMI
DE
FORMATIONE OVI, ET PVLLI
TRACTATVS ACCVRATISSIMVS.
A D
Illuſtriſs. & Reuerendiſs. D.D.
CAROLVM MEDICEVM
S.R.E. Cardinalem Ampliſsimum.

PATAVII ex Officina Aloyſij Bencij Bibliopolæ.
M. D C. X X I.
SVPERIORVM PERMISSV.

Fig. 11.—Frontispiece of *De Formatione Ovi et Pulli.* Translation:

Hieronymus Fabricius of Aquapendente, the widely celebrated former Anatomist at Padua, on *The Formation of the Egg and the Chick,* a highly accurate treatise. Dedicated to the Most Illustrious and Reverend Doctor of Divinity, His Eminence the Most Noble Cardinal Carolus Mediceus. Padua. Press of Aloysius Bencius, Bookseller. 1621. With permission of the Superiors.

Note: This treatise, in three chapters, profusely illustrated, shows the daily development of the chick, and observations from the fourteenth to the twenty-fourth day, i. e., to the time of hatching. The first chapter deals with the history of the uterus in birds; chapter two, of their function in the generation of the eggs; the third further discusses their function.

contends that every animal species has its own language, and he records instances of persons who could understand them. In support of his belief that men may learn to understand the speech of animals, he argues: 'If brutes that are scarcely capable of instruction understand when men speak to them, it should be far easier for man to understand brutes.' "

The final treatise in our book, though closely related to the preceding one, is not mentioned by Doctor Grindon. It is *De Locutione et eius instrumentis;* that is, The Mechanics of Speech. There is one full-page plate showing the organs of speech, except that the larynx is not laid open. The elements of articulation and production of voice, their places of production and mechanics, the mechanical reasons for mispronunciation, peculiarities of speech in various lands, and the multitude of citations and illustrative anecdotes make this treatise as interesting to phonologists as to medical men. Fabricius always wrote colloquially when the subject permitted, constantly revealing his neighborly attitude. Quotable passages abound; here is one:

"The Emperor Charles V, I have heard tell, used to say that German is the language for soldiers; Spanish, for lovers; Italian is suited to oratory; and French to the converse of nobles. But Alius, who was a German, referring to what Charles had said, remarked that Spanish is best in prayer to God, because it is grave and majestic; Italian is of an intimate nature and suited to friendly conversation; French is the most effective in persuasion, since it is the softest speech; but if threats are needed and a harsh mode of address, speak in German, as it is the roughest, most vehement and menacing."

It is noteworthy that English is ignored by both Charles and Alius.

"There are several works of Fabricius," says Professor Singer, "which illustrate the first stirring of the new physiological movement. Such treatises as that *On Respiration and its instruments* exhibit the complete helplessness of physio-

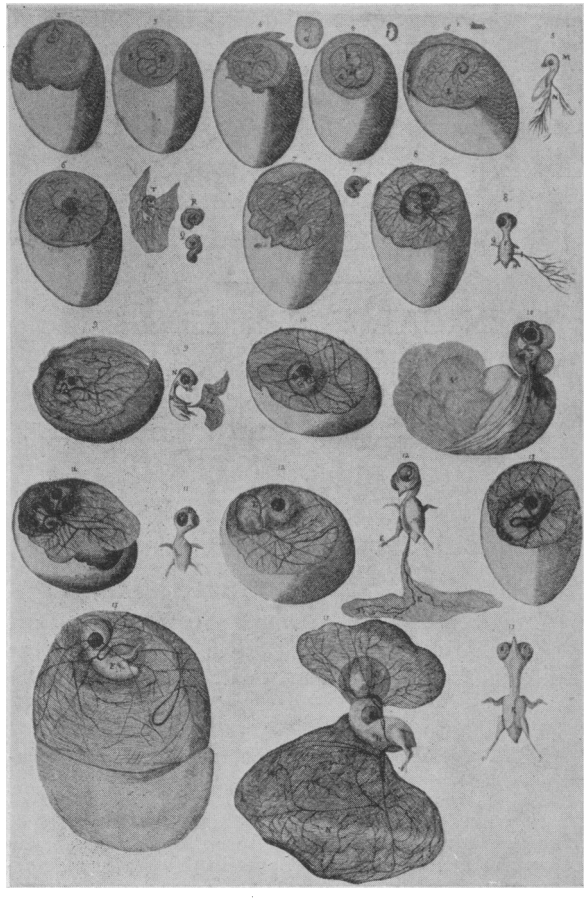


Fig. 12.—Reproduction of page 63 of *De Formatione Ovi et Pulli* and translation of the accompanying explanation of the figures. Figure 2 is of the egg as it appears on the second day after incubation. A, obtuse part, in which nothing has been formed as yet, excepting that the albumen has taken on greater concretion. Figure 3, third day; B, the membrane called chorion. C, umbilical vessels running through the chorion. D, larger branches. E, yolk. Figure 4, fourth day. F, body of chick, like a very small flea. G, chorion. H, several small branches of the vessels issuing from the chick. I, an extracted fetus, showing head and spine. K, fetus leaning toward middle of egg. Figure 5, fifth day. L, the large membrane and the fetus. M, an extracted fetus with head and spine. N, umbilical vessels inclining down from the fetus. Figure 6, sixth day. O, larger fetus, conglobated. P, the larger umbilical vessels. Q, first fetus extracted, wrapped in membrane. R, second fetus conglobated. S, third fetus extracted. T, head larger than the rest. U, large prominent eyes. Figure 7, seventh day. A, yolk, diminished more than in the preceding. B, extracted fetus, of same size as in Figure 6. C, bladder projecting from head and taken to be the brain. Figure 8, eighth day. D, larger fetus, body apparently formed. E, E, vein and artery entering the navel. F, extracted fetus. G, incipient wings. H, legs. I, umbilical vessels entering navel. K, large head. Figure 9, ninth day. L, larger fetus and larger vessels. M, extracted fetus. N, eyes apparently quite formed. O, beak. formed. P, vessels with membrane inserted in navel. Figure 10, tenth day. Q, fetus, in middle of egg. R, extracted fetus. S, bladder enveloping head, like kidneys. T, head quite formed and clear. U, chorion, with fetus in water. Figure 11, eleventh day. A, still larger fetus. B, eyes of extracted fetus, the largest feature. Figure 12, twelfth day. C, fetus conglobated in egg. D, larger and fuller vessels. E, right foot of extracted fetus, toes distinct. Also E, vessels with membrane appended to navel. Figure 13, thirteenth day. F, larger fetus. H, first fetus extracted with yolk, albumen, and vessels. I, vessels extended through yolk and albumen. M, membrane surrounding yolk. N, third membrane enveloping fetus. O, third perfect fetus, feathers appearing.

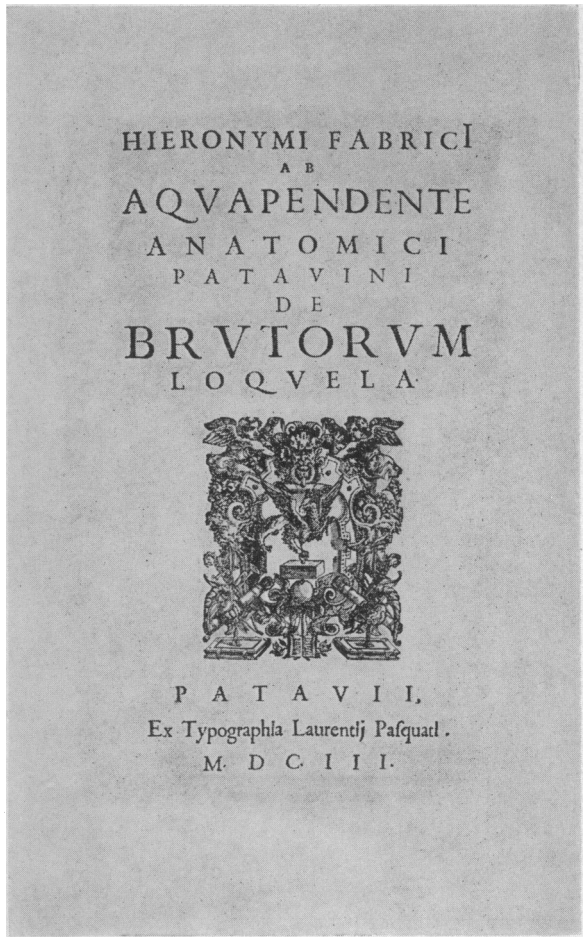


Fig. 13.—Translation of the frontispiece of *De Brutorum Loquela:*

Hieronymus Fabricius of Aquapendente, Anatomist, of Padua on *The Speech of Animals.* Padua. Press of Laurentius Pasquatus. 1603.

Note: The treatise is in six chapters, dealing with (a) whether animals really speak, and what kind of speech; (b) whether human speech differs greatly from that of other animals; speech between animals; (c) use and purpose of speech between animals; (d) expression, among themselves and toward others, of animals to show mental states; (e) manner in which the speech of animals may probably be understood and learned; (f) the organs of speech in animals, the most important parts thereof, and the manner of articulation.

logical thought in the absence of any real knowledge of the workings of the heart or of the nature of the respiratory exchange. We have here merely an intellectual discontent with current views without any systematic building of new knowledge. Somewhat more hopeful is the outlook when Fabricius attempts to analyze the muscular action of the digestive tract. He also wrote a book devoted to vision, in which he gave good figures of the structure of the eye, being the first of moderns to grasp the true form of the crystalline lens."

Of instruments devised or recommended, a few may be noted in a very cursory reading: In operating for pterygium, Fabricius used a leaden ring slipped between the eyelids, taking pains to spare the caruncle; a new instrument for removing nasal polypi is described; when inflammation prevents separating the jaws, the patient may be fed through a curved canula inserted through one of the nares; artificial teeth and instruments for extracting teeth; instruments for removing foreign bodies from the esophagus and the ear; an apparatus for torticollis; use of the catheter—these are only a few of the great number, many of them of his own invention, that might be listed.

For some reason we do not divine, this kindly man had a grudge against his contemporary Eustachius, whom he mentions only to oppose;

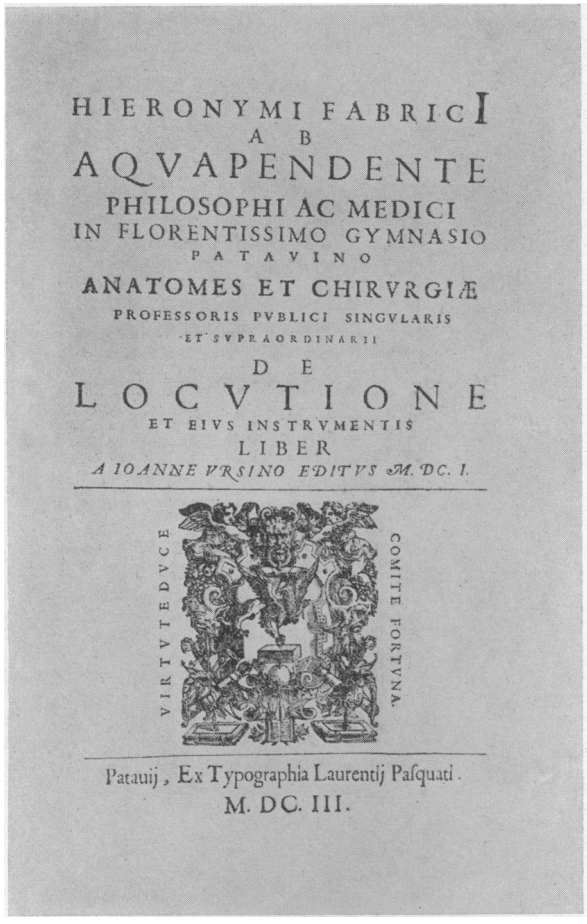

HIERONYMI FABRICI
A B
AQVAPENDENTE
PHILOSOPHI AC MEDICI
IN FLORENTISSIMO GYMNASIO
PATAVINO
ANATOMES ET CHIRVRGIÆ
PROFESSORIS PVBLICI SINGVLARIS
ET SVPRAORDINARII
DE
LOCVTIONE
ET EIVS INSTRVMENTIS
LIBER
A IOANNE VRSINO EDITVS M. DC. I.
VIRTVTE DVCE
COMITE FORTVNA.
Patauij, Ex Typographia Laurentij Pasquati.
M. DC. III.

Fig. 14.—Translation of the frontispiece of *De Locutione:*
The Book of Hieronymus Fabricius of Aquapendente, Philosopher and Physician at the most flourishing Gymnasium of Padua, Unique and Extraordinary Public Professor of Anatomy and Surgery, on
Language and Its Instruments.
Published by Johannes Ursinus, 1601.
Padua. Press of Laurentius Pasquatus
1603

Note: This treatise, dedicated to Thomas Zamoyski, son of Johannes, Chancellor of Poland, deals in thirteen chapters with the anatomy of language, as follows: (a) use of language explained, not grammatically, but philosophically; (b) Aristotle's definition; (c) detailed description of articulation; (d) the letters and their kinds; (e) the seven philosophical problems of letters expounded and solved; (f) syllables; (g) the double organ of language, causes of consonants and vowels; (h) places of production of vowels and their effect; (i) functions of the tongue, lips, etc., in articulation; (j) effective and useless motions of the tongue in articulation; (k) the various formations and pronunciations of the letters; (l) the number of letters and the varieties of dialects; (m) the natural letters [i. e., as pronounced; the written letters Fabricius calls "artificial"].

for instance, he credits Aristotle with the discovery of the eustachian tube, and ignores the discovery by Eustachius of the external ligament of the malleus.

He failed to see the use of the cochlea, discovered by Fallopius, and calls it a mass of formless cavities of which no exact description can be given. There are but few of such lapses, however; the marvel is that Fabricius saw so much and exhibited such originality. And it is greatly to his credit that, though so daring and resourceful a surgeon, he constantly advises against resort to the knife except when all medical means have failed, and gentle surgical measures are frequently substituted for the more severe ones in use. "Satius est sine spe patientes mori quam occidi," [1] he says; and I may terminate this sketch with a rule he reiterates which might be, even today, more closely followed: "Chirurgia omnino dimittenda est quando medicamentum sanare potest." [2]

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1 "It is better for patients to die without hope than to be slaughtered."

2 "By all means dispense with surgery when a cure can be effected by medicine."

CLINICAL NOTES AND CASE REPORTS

RELAPSING FEVER: A NEW ETIOLOGICAL OBSERVATION*

WITH CASE REPORT OF A FIELD WORKER

By ROBERT T. LEGGE, M. D.
Berkeley

THE introductory comments to the case report which follows are printed in this issue in the Editorial Comment department. (See page 380.)

REPORT OF CASE

C. W., age 29, single. A young medical entomologist, a graduate student at the University of California, was employed by the California State Board of Health, on account of the reporting of a few cases of relapsing fever in California, to make a field survey of certain ticks found on rodents in this state to determine whether these vectors were carriers of spirochetes. The place of operation was in Sierra County. A species of tick of the genus Ixode, a larval variety, light gray in color, about half the size of a pin-head, was found on chipmunks and tamarack squirrels. Many of these animals were shot, and in some of the specimens spirochetes were found on microscopical examinations of the blood smears.

Eight days before the onset of the prodromal symptoms, the patient sustained a deep scratch of his right thumb and had a raw area on his hand from a burn, and while handling a freshly killed tamarack squirrel the blood of the animal contaminated his wounds. The blood smear of this animal was positive for spirochetes, and when inoculated in laboratory mice produced spirochetosis. The incubation period and the symptoms were typical. The patient came home as soon as the prodromes appeared. He was seized with a dull mental depression, chill and sweating, severe frontal headache, pains in his back, thighs and forearms. Face flushed and hot. Temperature, 101 degrees Fahrenheit. Vomited several times. Complained of a cough and being very ill.

Physical Examination.—Eyes suffused, tongue coated, chest negative. Abdomen, no macular spots; liver and spleen, slight dullness; some sensitiveness on palpation. Urine: Specific gravity, 1.030; trace of albumen; sugar, negative; few granular casts. Blood count: White blood cells, 12,800; polymorphonuclears, 89 per cent; malarial organisms, negative. Agglutination tests: Typhoid, undulant fever, and tularemia, negative. Spirochetes found in smear.

A white mouse inoculated with the patient's blood died from the disease with positive blood findings (*Spirochæta recurrentis*).

Diagnosis.—On account of cough, fever and aching, influenza might be suspected. Typhoid was considered. The history of contact and the spirochetes found

* From the department of hygiene, University of California.

* Read before the Alta Bates Hospital staff meeting, September 12, 1932.